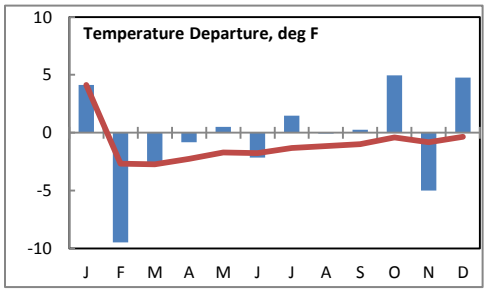
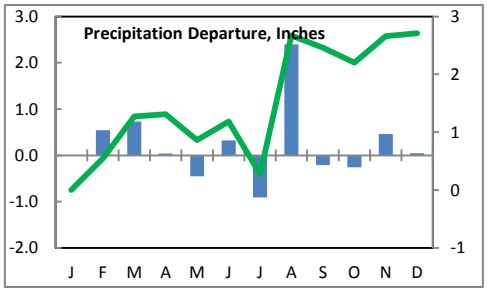
Montana Weather/Precipitation Summary

December 2014 by NOAA's National Weather Service Great Falls Montana

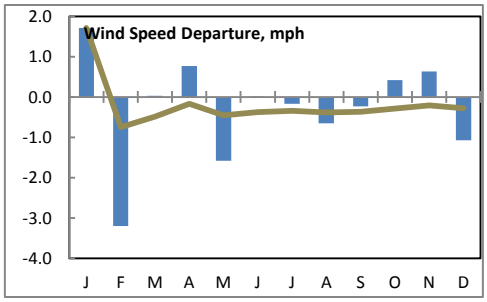
General westerly flow persisted for most of December (Fig. 1). This produced temperature averages above normal across the state. Precipitation averaged very close to normal. Flow aloft was near the long-term normal for the month.

Statewide composite temperatures averaged 4.8°F above normal for the month. The temperature anomalies ranged from +1.6°F at Thompson Falls to +6.6°F at Jordan. The warmest average monthly temperature was 34.5°F at Norris Madison, and the coolest was 16.4°F at Plentywood. For the past 12-months, the statewide composite average temperature is 0.4°F below normal. Six of the past 12 months have recorded temperature averages below normal.





The monthly departure from normal for precipitation across Montana is shown in Figure 3. Above normal precipitation fell across much of western Montana, with below normal values in the northeast. The highest amount was 10.90-inches at Noisy Basin (Flathead County) and 5.05-inches near Haugen. Statewide, December averaged 0.85-inches, or 0.05-inches above normal. The statewide composite precipitation for the past 12 months is 2.71-inches above normal. Snowfall amounts were variable. Much of the east received less than normal snowfall. The Statewide average was 9.6-inches, or 1.2-inches below normal. The heaviest amount was 36.2-inches at Big Sky.



The statewide average winds were below normal this month. This was the 4th calmest December of record. The statewide composite average was 7.9 mph (1.1-mph below normal), with the 12-month average running 0.3-mph below average. The fastest average speed was 19.9 mph at Deep Creek RAWS, while Livingston recorded an average of 16.7 mph. The fastest measured gust of the month, 96 mph, occurred at Babb on the 23rd.

Refer to NCDC's State of the Climate report for the latest monthly discussion: http://www.ncdc.noaa.gov/sotc/.

Dec 1-12

After a cold start to December, temperatures rebounded to as much as 25 to 30 degrees above normal by the 10th. As with warmer conditions, windy conditions were more common east of the divide. A cold front moving through the region on the 5th brought freezing rain to the Great Falls area. This primarily affected the city, as temperatures remained cooler than the airport. Winds returned on the sixth, with gusts reaching 66 mph west of Bynum. From the 9th-12th, much above normal temperatures were felt. Record high temperatures were set at Bozeman, Great Falls and Helena on the 12th.

Dec 13-23

A larger storm system and cooler air brought a significant change to the mild temperatures across the state. Areas along and west of the divide reported snowfalls up to a foot from the 13th through the 14th. After a brief cool period, windy and warmer conditions again returned. On the 21st, a cold front generated rain showers east of the divide. Gusts with the showers reached 68 mph near Wyola and 60 mph at Billings. Meanwhile, gusts along the Rocky Mountain Front reached 70 mph west of Bynum. Freezing rain briefly fell over portions of northeast Montana,

especially in Phillips County. As another strong system began affecting Montana, high winds were felt along the east slopes of the Rockies and the Livingston area. Gusts reached 96 mph at Babb on the 23rd.

Dec 24-31
Windy conditions in the Livingston area blew over a semi, with gusts reaching 73 mph. Otherwise, the big story for Christmas Eve and day was snow. After a short period with no snow on the ground, many areas of central, western and southern Montana picked up significant snowfall. Great Falls set a daily record with 5-inches. Red Lodge measured 15.5-inches, while the mountains to the south picked up 2.5 feet. Areas west of the divide also saw snowfall. West Glacier picked up 10 inches. Snowfall continued through the rest of the month. Kalispell measured 5.1 inches on the 27th, with seven inches on the ground on the 28th. On the 28th, most areas of the state had snow. Red Lodge picked up another 1.5 feet, Woods Bay, Columbia Falls and Woods Bay all measured a foot or more. Flatwillow measured 5 inches and a foot fell near Great Falls. After all the snow, temperatures plummeted. Winds accompanying cold temperatures pushed wind chill values to -36 near Comertown (northeast MT) on the 29th. The coldest temperature of month was recorded on the 30th, with Elk Park dropping to -40°F. This was the coldest temperature in the state since February 2014.

Precipitation/convection

Severe convective weather occurred on zero days in December. This is normal for the month.

2014 summary
From a preliminary standpoint, the statewide average temperature was slightly below normal. The statewide average was 42.9°F, or 0.4°F below normal. This was the coolest year since 2011. Meanwhile, precipitation was above normal. With an average of 17.92-inches, this was the wettest year since 2011, and 2.71-inches above normal. The mean snowfall was 67.8 inches, and the snowiest since 2011. 2014 ranks as the 18th snowiest of record, and 11.8 inches above normal. The annual wind average was 9.0 mph, 0.1 mph above normal. This year averaged the windiest since 2011, but was the 25th calmest of record.

December summary information:

High Temperature	67°F at Yellowtail Dam (12th)	**Greatest Precip**	5.05" at Haugen
Low Temperature	-40°F at Elk Park (30th)		10.9" at Noisy Basin SNOTEL (Flathead)
Warmest Ave Temp	34.5°F at Norris Madison	**Peak Wind Gust**	96 mph at Babb (23rd)
Coolest Ave Temp	16.4°F at Plentywood		
Range of Temp departures	+1.6°F at Thompson Falls to +6.6°F at Jordan	**Highest Ave Wind**	18.6 mph at Livingston 20.1 mph at Deep Creek
21 city mean monthly Temperature/Normal	25.1/20.3F 4.8F above normal. 42nd warmest of record (since 1880). 68th percentile. Jan-Dec 42.9/43.3 0.4F below normal. 46th coolest of record.	**20 city mean monthly wind speed/Normal**	7.9 mph/9.0 mph; 4th calmest of record (since 1936). 6th percentile. Jan-Dec 9.0 mph/8.9 0.1-mph above normal. 25th calmest of record.
22 city mean monthly precipitation/Normal	0.85/0.80" – 106% of normal. 66th wettest of record (since 1880). 87th percentile Jan-Dec 17.92"/14.63" – 2.71" above normal. 11th wettest of record.		

Historical Rank of Precipitation (inches) for the Current Month and Water Year to Date

Location	Dec	% of Norm	Rank	Pcntl	Oct 1 – Dec 31	% of norm	Rank	Pcntl	Years
Baker	0.44	186%			1.44	73%			17
Billings	0.67	100%	81	70	1.57	59%	40	35	114
Belgrade	0.59	116%	46	58	1.93	81%	28	35	78
Butte	0.56	110%	71	58	2.39	126%	90	74	121
Cut Bank	0.32	160%	68	63	2.12	212%	98	91	108
Dillon	0.48	185%	66	88	1.16	87%	38	50	75
Glasgow	0.11	28%	18	15	1.26	81%	44	37	117
Great Falls	1.10	200%	101	81	2.95	148%	104	84	123
Havre	0.34	85%	60	44	1.57	111%	71	52	135
Helena	0.81	203%	104	76	2.28	145%	94	68	137
Jordan	0.27	93%			1.19	76%			18
Kalispell	2.35	151%	106	88	6.08	152%	109	90	121
Lewistown	0.64	97%	58	48	2.19	88%	44	36	119
Livingston	0.41	79%	47	41	1.94	82%	35	31	112
Miles City	0.18	62%	33	23	1.01	63%	30	21	138
Missoula	1.26	124%	92	66	5.30	178%	126	93	135
Mullan Pass	4.48	100%	34	45	15.60	126%	52	69	75
Wolf Point	0.15	50%			0.57	38%			17
Glendive	0.22	58%	31	25	1.69	89%	57	49	116
Sidney	0.25	48%	24	31	1.74	80%	38	50	75
BZN-MSU	1.05	113%	93	69	4.40	115%	111	81	136

Rankings and Percentiles are 1=driest, higher numbers=wetter.
For an automated version of this chart, updated daily, go to
http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS

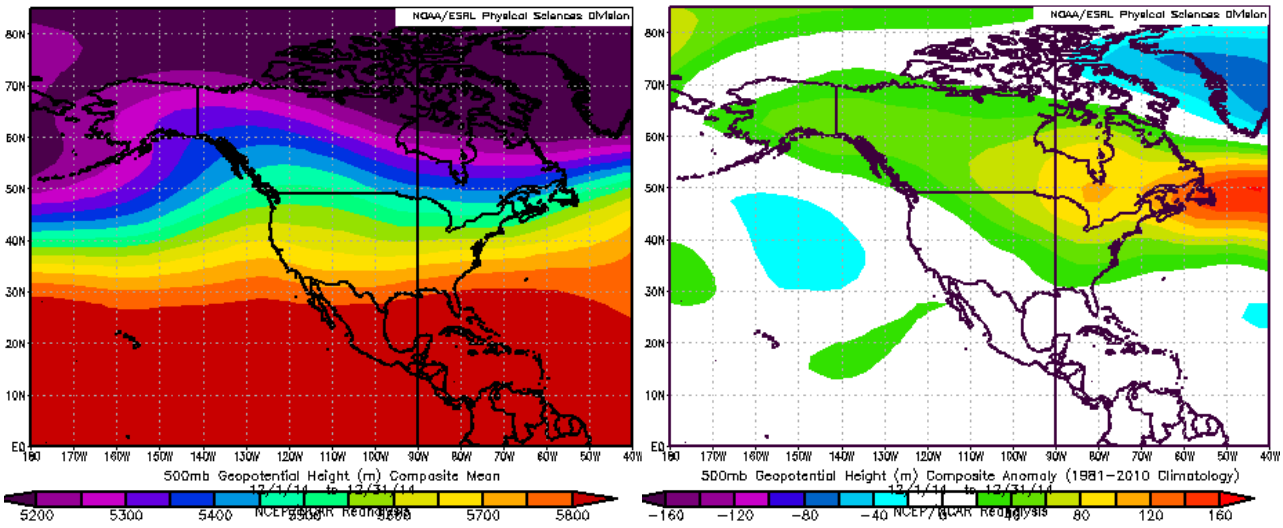


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (top-left) and departure from normal (top-right).

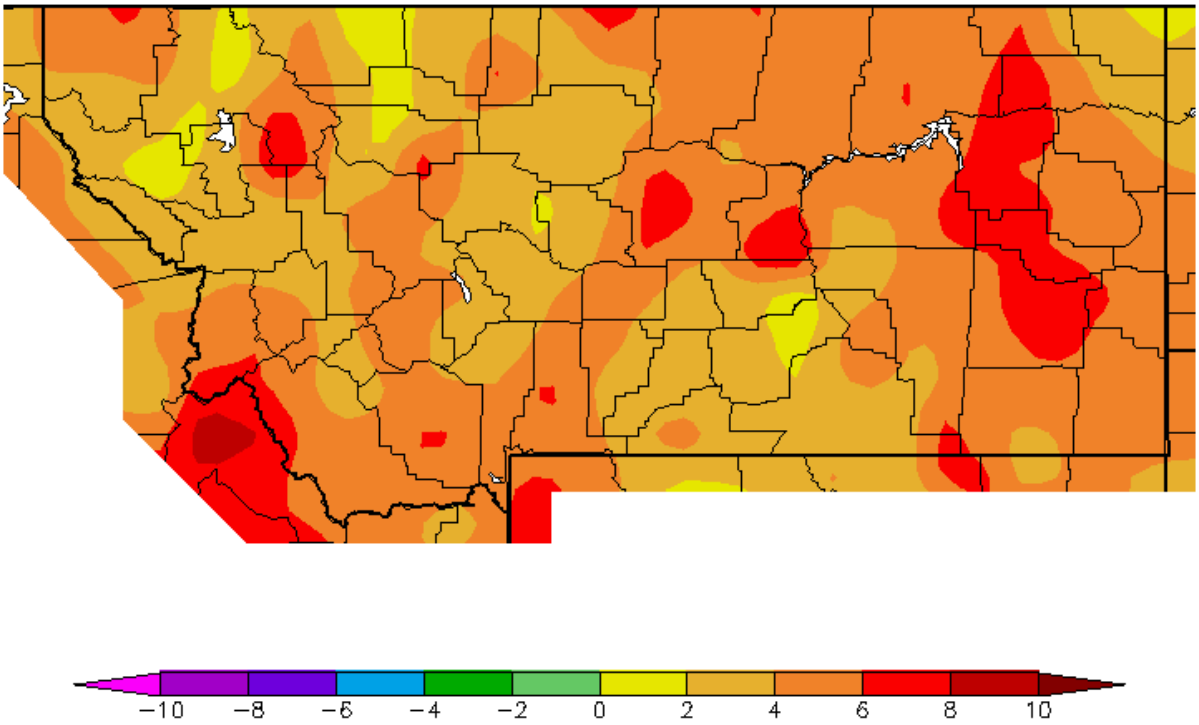


Figure 2. December 2014 temperature departures from normal (°F) (Western Region Climate Center).

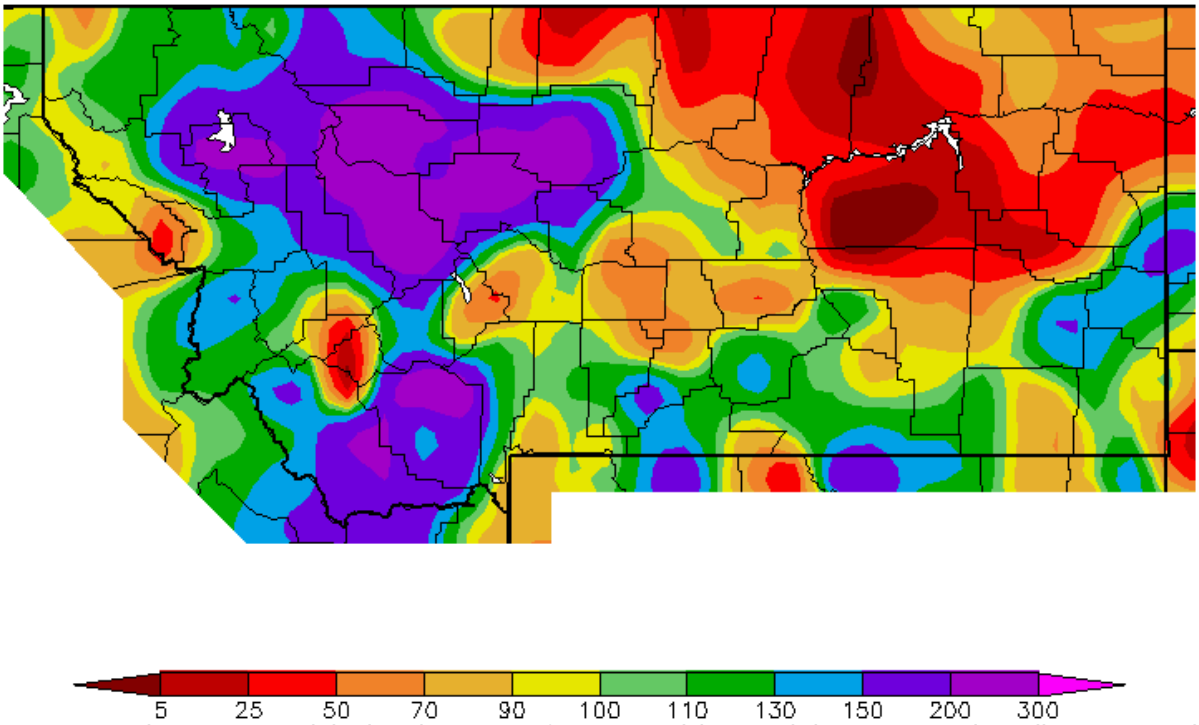


Figure 3. December 2014 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to: http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=tfx

For the latest information on mountain snowpack from the NRCS, go to: http://www3.wcc.nrcs.usda.gov/snow/index.html

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: http://droughtmonitor.unl.edu/

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) http://www.ncdc.noaa.gov. Many more links are on the Drought Information Page of the NWS Great Falls web site at http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tfx. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.